

CLAIMS

What is claimed is:

1. A system comprising:
a first component that generates heat; and
a second component that is thermally connected to the first component;
wherein the heat from the first component is transferred to a coolant through the second component; and
the second component has a function in the system associated with an operation of the system other than transferring heat.
2. The system of claim 1, wherein the first component comprises a plurality of first components, each of which generates heat.
3. The system of claim 1, wherein the second component comprises a plurality of second components, each of which has an respective function in the system that is associated with a respective operation of the system.
4. The system of claim 1, wherein the second component comprises:
a cooling solution for transferring heat to the coolant.
5. The system of claim 1, wherein the system is a computer system and the second component is selected from the group consisting of:
a memory module, a dual-inline memory module, a single-inline memory module, a RAM memory module, a ROM memory module.
6. The system of claim 1, wherein the system is a computer system and the first component is selected from the group consisting of:
a processor, a memory controller, an I/O controller, a cache chip, a crossbar chip, and an integrated circuit device that generates more heat than that which can be transferred by a packaging of the device.
7. The system of claim 1, wherein the coolant is air.

8. The system of claim 1, wherein the second component operates as a heat sink fin for the at least one component.

9. The system of claim 1, wherein the second component is connected to one side of a board and the first component is connected to another side of the board.

10. The system of claim 1, further comprising:
a first board that supports the first component; and
a second board that supports the second component and is thermally connected to the second component, and is connected to the first board;
wherein a portion of the second board is thermally connected to the first component.

11. The system of claim 10, wherein the second board is removably attached to the first board.

12. The system of claim 10, wherein the first board and the connected second board are removably connected to the system.

13. The system of claim 10, further comprising:
a ball grid array that is used to connect the first component to the first board.

14. The system of claim 10, further comprising:
a conformal thermal transfer material that located between the second board and the first component.

15. The system of claim 10, further comprising:
at least one support that is located on the periphery of the first component and protects the first component from forces exerted on the second board.

16. The system of claim 10, further comprising:

at least one support that is located on the periphery of the first component and protects the first component from forces exerted on the second board;

wherein the at least one support surrounds the first component and is connected with the first board and the second board so as to form an electromagnetic interference shield that reduces interference between the first component and an environment external to the first component.

17. The system of claim 10, further comprising:

at least one support that is located on the periphery of the first component and protects the first component from forces exerted on the second board;

wherein the second component comprises a plurality of memory modules and the second board further comprises:

at least one memory module connector, each of which is associated with a memory module of the plurality of memory modules, and connects its associated memory module to the second board.

18. The system of claim 10, wherein the second component comprises a memory module, and the memory module is directly attached to the second board.

19. The system of claim 10, wherein the second component comprises a memory module, and the memory module is directly attached to the second board;

wherein the memory module is attached at a 45 degree angle with respect to a surface of the second board.

20. The system of claim 10, wherein the second component comprises a memory module, and the memory module is directly attached to the second board;

wherein the memory module is attached at a 90 degree angle with respect to a surface of the second board.

21. The system of claim 10, further comprising:

a plurality of devices that are attached to the second board;

wherein the plurality of devices are connected to vias in the second board, whereby the vias conduct heat from the at least one component to the at least one memory module.

22. The system of claim 10, further comprising:

a plurality of devices that are attached to the second board;
wherein the devices are bus terminators.

23. The system of claim 10, further comprising:

a plurality of devices that are attached to the second board;
wherein the plurality of devices are located with a first portion on one side of the second board and the first component is thermally connected to a second portion on the opposite side of the second board.

24. The system of claim 10, further comprising:

a plurality of devices that are attached to the second board;
wherein the plurality of devices are located with a first portion on one side of the second board and the first component is thermally connected to a second portion on the opposite side of the second board; and

the first portion and the second portion are adjacent to each other.

25. The system of claim 10, further comprising:

a plurality of devices that are attached to the second board;
wherein the plurality of devices are located with a first portion on one side of the second board and the first component is thermally connected to a second portion on the opposite side of the second board; and

the first portion is peripherally located on the second board with respect to one axis of the second board, and the second portion is centrally located on the second board with respect to the one axis.

26. A method for cooling a first component of a system that generates heat, comprising:

providing a second component in the system that has a function associated with an operation of the system other than transferring heat;

thermally connecting the second component to the first component, whereby heat generated by the first component is transferred to the second component; and

transferring heat from the second component to a coolant.

27. A method for cooling a first component of a system, comprising:
 - generating heat by the first component;
 - transferring heat from the first component to a second component in the system that has a function associated with an operation of the system other than transferring heat; and
 - transferring heat from the second component to a coolant.
28. A device for transferring heat from a system comprising:
 - a first portion for connecting a first component that has a function associated with an operation of the system other than transferring heat;
 - a second portion for thermally connecting a second component that generates heat;
 - a third portion for connecting the first portion to the system, thereby enabling the function of the first component; and
 - a thermal conduction path between the first portion and the second portion, whereby heat from the second component can be transferred to the first component for dissipation to a coolant.
29. A system comprising:
 - a component that generates heat; and
 - means for transferring the heat from the component to a coolant and performing a function in the system associated with an operation of the system other than transferring the heat.